

CLAIMS

1. A starting device (100) for at least one internal combustion engine, in particular a pull-rope type starting device for at least one two-stroke or four-stroke motor, which comprises at least one pulley or rope drum (4) which is rotatably held in at least one housing (1), wherein said starting device, for generating the drive torque for the motor shaft by means of at least one handle (10), in particular by means of at least one starter handle or pull handle, is rotatable by way of at least one load transfer means (9), in particular by way of at least one starter rope or pull-rope, and by way of at least one elastic coupling element (6), in particular by way of at least one spiral spring, is connected to at least one engaging element (5), in particular to at least one ratchet-type engaging element, by means of which the drive torque can be transmitted to the motor shaft,

characterised in that

the angle of rotation by which the ratchet-type engaging element (5) is rotatable in relation to the pulley or rope drum (4) by exerting a load on the elastic coupling element (6) is limitable to at least one specifiable maximum angular value.

2. The starting device according to claim 1, characterised in that the angle of rotation is limitable by at least one limit stop (13; 13') arranged on the engaging element (5), in particular arranged on the underside of the engaging element (5), which underside faces the pulley or rope drum (4).
3. The starting device according to claim 2, characterised in that the limit stop (13; 13') is shaped as a circular segment or arc-shaped segment, and/or is guided in a guide groove (14; 14'), in particular formed in the manner of a section of an arc of a circle, with said guide groove (14; 14') being provided in the pulley or rope drum (4).
4. The starting device according to claim 2 or 3, characterised in that, for the purpose of achieving the maximum angular value, the limit stop (13; 13') comes to rest against at least one rest surface (15; 15') in particular at the end of the guide groove (14; 14').

5. The starting device according to claim 4, characterised in that the rest surface (15; 15') is formed by the closed end of the guide groove (14; 14') and/or in the form of at least one limit stop damping device, in particular a limit stop damping device made of elastomer material, provided for damped stopping of the rotary movement.
6. The starting device according to at least one of claims 2 to 5, characterised in that two limit stops (13, 13') are provided which are arranged so as to be essentially diametrically opposed to each other, and/or so as to be offset by approximately 180 degrees in relation to each other.
7. The starting device according to claim 6, characterised in that each of the two limit stops (13, 13') is guided in at least one guide groove (14, 14') each, and in that the two guide grooves (14, 14') are arranged in the pulley or rope drum (4) so as to be essentially mirror inverted, and/or so as to be offset by approximately 180 degrees in relation to each other.
8. The starting device according to claim 6 or 7, characterised in that, for the purpose of achieving the maximum angular value, the two limit stops (13, 13') come to rest against their rest surfaces (15, 15') at the same time, in particular at the end of the respective guide groove (14, 14').
9. The starting device according to at least one of claims 1 to 8, characterised in that the maximum angular value which is provided when the starting device (100) is activated, in particular when the handle (10) is pulled, is in the magnitude of approximately 270 degrees to approximately 280 degrees divided by the number of limit stops (13; 13') used, i.e. in particular in the magnitude of approximately 270 degrees to approximately 280 degrees if one limit stop (13) is provided; or in the magnitude of approximately 135 degrees to approximately 140 degrees if two limit stops (13, 13') are provided.
10. The starting device according to at least one of claims 1 to 9, characterised in that in the case of the coupling element (6) failing or breaking down, the engaging element (5) is rotatable if the starting device (100) is activated, in particular if the handle (10) is pulled.

11. The starting device according to at least one of claims 2 to 8 and according to claim 10, characterised in that in the case of the coupling element (6) failing or breaking down, the engaging element (5), as a result of the limit stop (13) resting against the rest surface (15), is rotatable when the starting device (100) is activated, in particular when the handle (10) is pulled.
12. The starting device according to at least one of claims 1 to 11, characterised in that the coupling element (6) is pretensioned or comprises pretension.
13. The starting device (100) for at least one internal combustion engine, in particular a pull-rope type starting device for at least one two-stroke or four-stroke motor, which comprises at least one pulley or rope drum (4) which is rotatably held in at least one housing (1), wherein said starting device, for generating the drive torque for the motor shaft by means of at least one handle (10), in particular by means of at least one starter handle or pull handle, is rotatable by way of at least one load transfer means (9), in particular by way of at least one starter rope or pull-rope, and by way of at least one pretensioned elastic coupling element (6) or an elastic coupling element (6) comprising pretension, in particular by way of at least one spiral spring, is connected to at least one engaging element (5), in particular to at least one ratchet-type engaging element, by means of which the drive torque can be transmitted to the motor shaft.
14. An internal combustion engine, in particular a two-stroke or four-stroke motor, characterised by at least one starting device (100) according to at least one of claims 1 to 13.
15. A work tool, in particular a portable hand tool powered by an internal combustion engine, such as for example a brush cutter, a chainsaw, a motor saw, an abrasive cutting-off machine or the like, characterised by at least one internal combustion engine according to claim 14, which internal combustion engine comprises at least one starting device (100) equipped according to at least one of claims 1 to 13.

16. A use of at least one starting device (100) according to claim 14, with said starting device (100) being associated with at least one internal combustion engine according to claim 15, for a work tool according to at least one of claims 1 to 13.